OFFICE OF THE DIRECTOR
DEFENSE RESEARCH AND ENGINEERING
3040 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-3040

3 February 2003

Call for FY 2004 Distributed Centers Proposals

The mission of the High Performance Computing Modernization Program (HPCMP) is to provide world-class commercial, high-end, high-performance computing (HPC) capability to the DoD science and technology (S&T) and test and evaluation (T&E) communities. The program is organized into three major components to accomplish this mission: high performance computing resource centers, high-speed networking, and software applications support. The high performance computing resource centers include four major shared resource centers (MSRCs) supported by the HPCMP and a variable number of distributed centers (DCs) which receive partial funding from the HPCMP. MSRCs satisfy the majority of batch-oriented computational requirements of HPC projects and efficiently manage very large HPC systems. However, some HPC projects have requirements that cannot be satisfied at MSRCs. Recognizing that these requirements exist, the HPCMP awards procurement funding to distributed centers for the purchase of local HPC resources. The Services and Agencies are typically responsible for providing sustainment funding to the distributed centers.

The High Performance Computing Modernization Program Office (HPCMPO) is soliciting FY 2004 distributed centers proposals and requests your assistance in identifying the organizations with high priority unsatisfied HPC requirements. These local HPC requirements include but are not limited to real-time applications, special operational considerations, technology investigations, or other special access needs. Based upon current budget projections, we anticipate the selection of three to five proposals. Funding provided, except in unusual circumstances, will not exceed $4M per project and must be obligated in FY 2004.

The Call for FY 2004 Distributed Centers Proposals, Attachment 1, defines the proposal submission, evaluation and selection process. As part of this process, I request your assistance to ensure that the appropriate organizations are made aware of this opportunity.

In addition the High Performance Computing Advisory Panel (HPCAP) principals are requested to forward only those proposals having high relevance to their service/agency mission. In a separate and later step in the process, you will be asked to prioritize all forwarded proposals as outlined in Attachment 2.

The HPCMP point of contact for this activity may be reached at dc-proposal-team@hpcmo.hpc.mil.

Attachments:
1. Call for FY 2004 DoD HPCMP Distributed Centers Proposals
2. General Instructions for FY 2004 DoD Distributed Centers Proposal Packages

ATTACHMENT 1

CALL FOR FY 2004
DOD HIGH PERFORMANCE COMPUTING MODERNIZATION PROGRAM
DISTRIBUTED CENTERS PROPOSALS

INTRODUCTION

General: The High Performance Computing Modernization Program Office (HPCMPO) is soliciting proposals to satisfy high priority requirements that cannot be met with existing high performance computing (HPC) resources. Only proposals for HPC resources will be considered; proposals primarily for storage, visualization, or networking will not be considered.

The goals for distributed centers are to support projects that generally:

(1) Require access to data or computational resources under time critical constraints that cannot tolerate network limitations and must seek local solutions rather than use MSRC resources.

(2) Require extreme security, have unconventional operating conditions, or need early access to new technology in ways that do not always permit the sharing of MSRC resources.

Requirements Validation: Organizations submitting proposals should ensure that the projects to be supported in their proposals have been entered into the HPC Modernization Program (HPCMP) Requirements Database, and that their Service/Agency has validated the projects' requirements. The HPCMP point of contact for requirements entry and validation may be reached at require@hpcmo.hpc.mil.

Submission: Proposals must be submitted to the High Performance Computing Advisory Panel (HPCAP) Principals. Although DoD HPCMP distributed centers proposals are due to the HPCMPO from the HPCAP Principals by 24 April, each HPCAP Principal has established internal deadlines for submission to meet the 24 April deadline. Please contact your HPCAP Principal directly to determine their deadline.

The HPCMPO requires that each proposal packet be submitted as one **unbound** color original, one **unbound** color copy, and one PC-based diskette, ZIP disk, or CD-ROM electronic copy. All electronic files should be in Microsoft Office 95 (or later up through 2000) formats. An electronic proposal submission can be in the form of one file or multiple files. If there are multiple files, a "README.doc" file must be present in the electronic submission explaining the purpose of each file in producing a complete copy of the proposal. Questions relating to the mechanics of preparing a proposal packet can be directed to the DC Proposal Team at dc-proposal-team@hpcmo.hpc.mil. Any other questions should be directed to your HPCAP Principal.

Evaluation: Proposals will be ranked based on DoD priorities and technical merit. No briefings are required for the HPCMPO.

The HPCMPO technical evaluation panel (TEP) will determine technical merit. The TEP consists of representatives from the Services and DoD Agencies, and technical experts from outside of the DoD. HPCAP Principals may participate in the TEP meetings as observers.

Should the Technical Evaluation Panel, during their technical review, require clarification of any portion of the project proposal or points of clarity to the proposal, a supplementary request will be made to the proposing project manager for a response to such questions. The original proposing site will then have four days to provide a response forwarded for coordination back to the DC project review team at the HPCMPO. All responses, from all sites queried will then be in-turn forwarded to the TEP for their clarification and consideration as they complete their review. The questions raised by the TEP, if any, will be forwarded to the proposing sites on June 2th and responses back will be due NLT June 6th. Should there be no clarifications required of a proposing site, each such site will also be notified, accordingly.

Should the Technical Evaluation Panel upon completion of its technical review find the proposal technically unacceptable to the problem for which it was posed as the solution, the TEP will not amend the proposal as concerns the technical computing capability to make it a more viable solution. However, it is in the purview of the TEP to make advisories to the HPCMP Director (the final recommendor) as to changes in sub-components, e.g. amounts of memory, total disc storage capacity.

DoD priorities are determined and assigned by the HPCAP Principals. Each HPCAP Principal will have an opportunity to review all proposals including any comments from the TEP and indicate their relative DoD-wide priorities by assigning a score to each proposal.

Selection: Based on the results of the TEP review and the HPCAP assigned priorities, the HPCMP Director will prepare recommendations and forward them to the Deputy Under Secretary of Defense for Science and Technology (DUSD[S&T]) for selection.

Disbursement of Resources: Resources will be released to a selected organization after receipt of a signed Terms of Reference (TOR) document, in which the selected organization accepts the HPCMPO's oversight requirements and agrees to fulfill the stated obligations to the HPCMPO.

Schedule:

Date	Action
7 February 2003	HPCMPO solicits FY 2004 distributed centers proposals
24 April 2003	Distributed centers proposals due to HPCMPO from service/agency principals (Services and Agencies have earlier internal deadlines)
24 April – 30 April 2003	Review for completeness by HPCMPO
1 May 2003	HPCMPO distributes all proposals to HPCAP Principals
5 May 2003	HPCMPO distributes all proposals to TEP members
2 June 2003	Technical Evaluation Panel distributes questions (if any) for clarification to proposing sites
6 June 2003	Clarification questions from sites due to HPCMPO
19 June 2003	Technical Evaluation Panel reviews proposals
23 June 2003	TEP comments distributed to HPCAP
Mid-July 2003	HPCAP prioritization complete
15 August 2003	Director, HPCMP prepares recommendations for selection by DUSD(S&T)
October 2003	FY 2004 distributed centers awards announced

PROPOSAL CONTENT

Proposals are limited to 10 pages (one-sided, 8-1/2" x 11"). Supporting documents, not included in the 10 pages, are limited to: the cover sheet, staff resumes, proposed equipment lists (vendor quotes preferred), and network diagrams. All documents, including copies of vendor quotes, need to be in the electronic copy of the proposal. Each proposal should address all points outlined below. **The proposals will be structured such that they contain the following sections in the order given. Proposals that do not conform to this structure will be returned to the forwarding HPCAP Principal without further evaluation.**

Cover Sheet: This part of the proposal package should provide a brief description of the following:
   Identifier: Project title/distributed center name and location.
   Project leader/distributed center manage/financial manager: List the name of the project leader(s), the distributed center manager (if any) and the financial manager to include address and telephone numbers.
   Sponsoring Service/Agency and DoD Organization: List the Service/Agency and DoD organization sponsoring the distributed center.
   Technical emphasis: Describe the technical goals of the project to be supported by the HPC equipment being purchased or expanded.
   Specific objectives: Specify objectives to be achieved through the proposed purchase or expansion of the HPC equipment.
   Technical/engineering approach: Describe the technical/implementation approach.
   Technical and computational challenges: Describe technical and computational challenges to be encountered in meeting the objectives.
   Service/Agency impact: Describe Service/Agency impact of the work that will be performed by the HPC equipment.
   Schedule: Provide key project milestones.
   Keywords: Summarize keywords used in the proposal.

Introduction: This section should be used to introduce key proposal requirements in broad, general terms. Include a discussion of ongoing related work in both the proposing organization and the wider scientific, technology, and testing community.

Justification/DoD Relevance: <u>This section will be used primarily to assess the potential for military advantage of this proposed project and its Service/Agency mission priority.</u> Clearly state the military relevance of this proposal and what current and future DoD weapons systems or programs it will support, if any. Describe how this proposal supports the science and technology or test and evaluation program of DoD and/or your laboratory or test center, respectively. Explain how the support to be provided by this proposal, combined with the military relevance, translates into a military advantage to be gained by exploiting HPC capability.

Technical Approach: <u>This section will be used primarily to assess the scientific merit, potential for progress by the proposed project(s), and potential impact on mission areas supported</u>. Ensure that computational science, computational engineering, real-time environment, and computer science aspects are discussed. Clearly state the technical goals of the project(s) to be supported and lay out a program plan for achieving those goals. Discuss project or mission area requirements to be satisfied and why the proposed HPC equipment is necessary to satisfy those requirements. These requirements may include providing computational support to previously existing projects; if so, discuss those factors (for example, program environment, operations support, and physical infrastructure) that would make it beneficial to project users, the proposing organization, the Service/Agency, and to the DoD to perform this work at the proposing distributed center. If the proposed HPC equipment is to be embedded in a larger system or environment, show the overall system level architecture. Describe the proposed architecture and how it satisfies these requirements.

Provide a schedule with estimated milestones and anticipated accomplishments for HPC equipment acquisition and technical requirements to be supported by the proposed HPC equipment. Discuss specifically the operational/production level status of software to be used and numerical methods employed to satisfy the requirements, particularly the software's efficiency on the proposed system. Discuss technical and computational challenges to be encountered in the course of the project(s).

*Progress to Date***:** If this proposal is from a previously funded distributed center, discuss the progress to date on HPCMP projects that have utilized your center. Discuss what remains to be done and why it needs to be done at this distributed center.

Required Resources and Justification: Justify computational resources required to satisfy the requirements in terms of total processor hours, real-time graphics requirements, real-time processing requirements, dedicated system-level testing, and other relevant measures of quantifiable resource requirements. Include and justify memory, storage, graphics processing, networking, and software requirements. Summarize the hardware requirements in the tables given in the DoD distributed center hardware requirements section at the end of this document.

Resumes: Include a *resume* for each of the key personnel. Key personnel are considered to be the Distributed Center's Manager (if any), System Administrators, Project Leads for projects proposed to be supported by the HPC equipment, and the Information Systems Security Officer (ISSO).

PROPOSAL EVALUATION

Criteria: Proposals will be judged on the following criteria:

(1) DoD mission priority
(2) Military advantage gained by exploiting HPC
(3) Merit of scientific study including numerical methods
(4) Potential for significant progress
(5) Appropriateness of hardware solution for meeting requirements

The HPCAP Principals will prioritize proposals using criteria 1 through 4. The TEP will evaluate the proposals using criteria 5. The following provides examples of how each criterion may be applied.

DoD Mission Priority: This criterion may be represented, for example, by the Service/Agency priority for a few key weapon systems currently in the acquisition chain; the potential priority associated with new computer technology for the long term needs of DoD; or the priority of a few projects that require extreme security measures.

Military advantage gained by exploiting high performance computing: This criterion encompasses the value we may gain over our adversaries through successful prosecution of the work supported by the proposed HPC equipment. Generally included here would be areas such as providing better, more timely information for a mission requirement such as precision strike. The proposal could focus on concrete advantages associated with systems under development, or on the eventual advantage that would result from application of the science associated with the proposal.

Merit of scientific study including numerical methods: This criterion focuses on the quality of the science or engineering work that will be supported on the proposed HPC equipment, as determined by the scientific or engineering community of interest. This could be focused on the engineering aspect of this factor, or focused more on advancement of computer and information technology, or unique technical or engineering results that apply.

Potential for significant progress: This criterion considers evidence of past successes in performing the type of work to be supported on the proposed HPC equipment. For example, a project being proposed for support by an organization that has an existing infrastructure for supporting real-time applications (possibly on workstations) would have a better chance for progress than one that had no previous real-time experience or existing infrastructure. A project that would be supported by experts in computer and information technology, who have successfully debugged and exploited a new architecture, would typically be better positioned to make progress than an organization without such a track record. A project justified on the basis of extreme security requirements should already have accredited secure facilities in place.

Appropriateness of hardware solution for meeting requirements: This criterion considers such attributes as the processor, memory, graphics, interconnection network, and storage proposed and how these match with the validated requirements of the projects to be supported in the proposal. It also considers the expected utilization of the proposed system in areas such as appropriateness of numerical methods, use of simulation versus real military hardware, parallelization techniques, and the balance in the proposed capacities in each area. It could involve a determination of whether the storage, processor, and interconnection network are consistent with the real-time data rate, or whether the proposed graphics system will support real-time scene generation requirements. It could include a discussion of the efficiency and effectiveness of proposed numerical methods or techniques for time critical support of man-in-the-loop and/or hardware-in-the-loop. A project evaluating new technology could be expected to propose systems that may have some risks but would have significant value if the evaluations are successfully completed. It could include consideration of the extent to which the proposal may contribute to the suitability and effectiveness of future deployments of computer technology. Another area that will be considered is the extent to which the workload justifying the HPC equipment truly requires high performance computing. Aggregation of many small projects, none of which alone requires a high performance computer, is not an appropriate use of HPC resources.

DoD Distributed Center Hardware Requirements

Using the tables below as templates, please address requirements for the key projects justifying the proposal in the Required Resources and Justification portion of the proposal. If you are planning to use existing equipment to satisfy part of the requirement, complete one set of tables for the total requirement and another set showing what portion will be satisfied with existing equipment.

Project or Experiment	Typical Number of Processors	Maximum Number of Processors	Typical Number of Graphics Pipes	Maximum Number of Graphics Pipes	Typical Job Memory (GB)	Maximum Job Memory (GB)	Typical Job Secondary Storage (GB)	Maximum Job Secondary Storage (GB)

Project or Experiment	Typical Real-Time Data Rate	Maximum Real-Time Data Rate	Typical Real-Time Deadline	Minimum Real-Time Deadline	Typical Number of Iterations	Typical Duration of an Iteration	Equipment In the Loop (Y or N)	Man In the Loop (Y or N)

ATTACHMENT 2

General Instructions for FY 2004 DoD Distributed Centers Proposal Packages

Submission of Proposals: Each HPCAP Principal should review the proposals submitted to them by proposing organizations to ensure that they support mission-critical projects that can take full advantage of a high performance computing capability. Only those proposals that you feel meet this test should be selected and forwarded to the HPCMPO.

Please ensure that proposal packages have the content and structure indicated in the attached call for proposals. Proposals should be structured such that they contain all sections as defined in the Call for Proposals under Proposal Contents. Consistency of proposal content and format is essential to ensure fair, equitable, and consistent review. **Proposals that do not conform to the content and structure requirements will be returned without further evaluation.**

Please forward the selected proposal packets to arrive no later than 4:00 P.M. Eastern Daylight Time on **Thursday, 24 April 2003** to the HPCMPO at the following address:

> DoD High Performance Computing Modernization Program Office
> ATTN: HPC Centers Project Manager
> 1010 North Glebe Road, Suite 510
> Arlington, VA 22201-8205

Evaluation of Proposals for Technical Merit: The Technical Evaluation Panel (TEP) review will be conducted on Thursday, 19 June, at a location to be determined. HPCAP Principals are invited to participate in the TEP review as observers.

Prioritization of Proposals: After all FY 2004 proposal packets have been received by the HPCMPO, the HPCMPO will forward an electronic copy of all proposals, together with a document synopsizing the "Justification/DoD Relevance" section of each proposal and an electronic scoring spreadsheet to each HPCAP Principal. Upon completion of the technical review, comments by the TEP will also be forwarded to each HPCAP Principal. Each HPCAP Principal will then have the opportunity to assign a score for each of the first four proposal evaluation criteria for each proposal. These scores will take into consideration the comments as provided by the Technical Evaluation Panel. The criteria (1) through (4) will be scored from 0 to 20 points each for each proposal. Each proposal will then be assigned an aggregate score from zero to eighty points in the spreadsheet by adding the four individual criterion scores. The highest scored proposal will then be considered the highest prioritized proposal.

Your electronic scoring spreadsheet with your preliminary scoring and prioritizations should be brought to the HPCAP review meeting to be held on mid-July 2003 at a site to be determined.

The HPCMP point of contact for the TEP review may be reached at dc-tep-chair@hpcmo.hpc.mil.